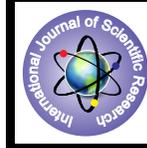


## *An Assessment of Different Gingival Biotypes in Individuals with Varying Forms of Maxillary Central Incisors and Canines: a Hospital Based Study.*



### Medical Science

**KEYWORDS :** Gingival biotype, Papillary height, central incisors, canines

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### ABSTRACT

*Aim: To assess the gingival thickness in relation to sex and age with varying forms of maxillary central incisors and canines.*

*Methods and Material: A total of 220 Patients in age group of 20 to 50 years with well aligned dentition and healthy gingival tissues were invited to participate in the study. Three clinical parameters crown width/length ratio of maxillary central incisors and canines, papillary height (PH) and gingival thickness were recorded.*

*Results: Thicker gingival biotype is associated with short, wider form of teeth while thinner scalloped biotype with long, narrow tooth form. The mean PH was found to be 4.51 mm in males and 4.04 mm in females.*

*Conclusions: Thicker biotype is more prevalent in male population while thin, scalloped gingival biotype in females. Thick flat biotype is seen in younger individuals. Decrease in PH is observed with thin biotype.*

### Introduction

The long term success of aesthetic restorations depends on several factors like gingival biotype, architecture of the gingival tissue and shape of the anterior teeth. The gingival morphology plays an important role in determining the final aesthetic outcome. Different gingival biotypes respond differently to inflammation, restorative, trauma and parafunctional habits. Some gingival features are influenced by tooth shape, position and size, as well as gender and age i.e many features of the gingiva are genetically determined.<sup>[1]</sup>

Seibert and Lindhe coined the term periodontal biotype to elucidate different gingival architecture types based on buccolingual thickness.<sup>[2]</sup> The thick biotype consists of flat soft tissue and thick bony architecture. This tissue form is more resistant to gingival recession due to its dense and fibrotic nature. Whereas, thin gingival biotype is delicate, highly scalloped soft tissue with thin bony architecture characterized by bony dehiscence and fenestrations, which is more prone to recession, bleeding and inflammation.. Claffey and Shanley defined the thickness <1.5 mm as a thin while >2 mm as a thick biotype.<sup>[3]</sup>

The aim of this study was to ensure the gingival thickness (GT), to study the frequency of gingival biotypes of upper central incisors and canines in relation to sex and age, also with varying forms of maxillary central incisors and canines and to determine the prevalence of gingival biotype in relation to papillary height (PH).

### Materials and methods:

A total of 220 Patients attending the Outpatient department in the age group of 20 to 50 years with well aligned dentition and healthy gingival tissues were invited to participate in the study.

The exclusion criteria of subjects were as follow: (i) Missing of any of the maxillary incisors and canines (ii) dental restorations in any maxillary incisor and canines (iii) Clinical signs of periodontal disease (iv) Pregnant or lactating females (v) History of previous periodontal surgery in upper anterior region (vi) Previous or current orthodontic treatment (vii) Attrition of the incisal edges of maxillary incisors and canines. All subjects provided informed consent for indulging in the present study.

Gingival thickness was assessed in each patient by a single examiner. For assessment of gingival morphology the following parameters were recorded: Crown width/crown length ratio (CW/CL) of both central incisors and canines was determined according to Olsson & Lindhe.<sup>[4]</sup> The crown length was measured between the incisal edge of the crown and the free gingival margin, or if discernible, the cemento-enamel junction. Crown width is the distance between the approximal tooth surfaces, was recorded at the border between the middle and the cervical thirds.

GT was evaluated and categorized into thick or thin on site. This evaluation was based on the transparency of the periodontal probe through the gingival margin while probing the sulcus at the midfacial aspect of both central maxillary incisors and canines to the full depth. PH was calculated as the distance from the top of the papilla to a line connecting the midfacial soft tissue margin of the two adjacent teeth and the mean value was calculated.

The measurements were calculated.

### Statistical analysis:

Mean thickness of gingiva were compared across different age groups by performing one-way analysis of variance (ANOVA). The unpaired *t*-test was used to compare mean thickness of gingiva between male and female subjects. Data was analyzed using statistical software STATA version 10.0.

### Results:

1. Prevalence of varying central incisors (Crown width/ Length ratio) among different gender: The frequency distribution of male population was 103 while female was 117 among the 220 subjects participating. In male population, the crown width / height ratio was 0.80 and 0.82 of the maxillary central incisors and canines resp. While female population have a ratio of 0.82 and 0.79 of the central incisors and canines, respectively. Males had a short wide form while females had long, narrow form.

2. Frequency distribution of different biotypes among male and female - Among the male population, thicker gingival biotype was more common (71.84%) when compared to females (48.72 %).

3. Prevalence of different gingival biotypes in participants with varying forms of central maxillary incisors: Among the participants with short, wide tooth form of maxillary central incisors, 71.84% had a thick gingival biotype while 28.16% had thin biotype while for the long, narrow tooth form of central incisors, 48.72% had thick gingival biotype while 51.28% had thin biotype.

4. Prevalence of various gingival biotypes in the participants with varying forms of upper central incisors and canines in relation to age: Out of the total participants, 103 were in the younger age group (20-30 years), 81 were in the middle age group (30-40 years) while 36 were in the old age group (40-50). Among the young group, more participants had thick gingival biotype (62.20%).

5. Evaluation of PH in relation to gingival biotype: The mean PH was found to be 4.51 mm in males and 4.04 mm in females. The PH was found to be lesser in participants with thin biotype as compared to thick biotype.

**Discussion:**

The aesthetic view of the gingiva is an important picture framework for patient's smile and restorative treatment. Determining the thickness of the gingival tissue plays an important role in treatment planning process for orthodontics, root coverage, extractions and implant placement especially in the maxillary anterior area.<sup>[5]</sup> The objective of the present survey was to evaluate the prevalence of the different gingival tissue biotypes in individuals with varying forms of upper central incisors and canines. The survey was carried on 220 subjects divided into three age groups. Because the thickness of the gingiva and bone tissues affects the treatment outcomes, possibly due to a difference in the amount of blood supply to the underlying bone and the susceptibility to resorption.

The transparency of a periodontal probe was chosen as it is considered atraumatic, rapid and with relatively low cost. Furthermore, this method was found to be an easy, reproducible, reliable and an objective method. A decision to study the maxillary central incisors and canines were made because previous studies have found that the difference between biotypes were more observable in these teeth.<sup>[6]</sup>

The frequency distribution of prevalence of GT in relation to groups of subjects with different combinations of morphometric data related to central maxillary incisors states that short, wider teeth are associated with thick biotype while long slender teeth are associated with thin biotype. Ochsenein and Ross believed that long-tapered teeth tend to have a thin-scalloped periodontium, whereas wide-square teeth have thick-flat periodontia.<sup>[1]</sup> In 1991, Olsson and Lindhe proposed that long-narrow teeth are more susceptible to Gingival Recession than short-wide teeth because of the difference in periodontal biotype.<sup>[4]</sup> In 1993, Olsson et al. reported no significant difference between narrow and wide crown forms with respect to the thickness of the free gingiva.<sup>[7]</sup>

In the present study, the frequency distribution of Gingival tissue states thicker biotype in males (71.84%) as compared to females (48.72). The results stated are in agreeable to those with De Rock et al.,<sup>[8]</sup> who stated 1/3rd of the sample to be females with a thinner biotype. De rock et al. in their study presented that male participants had thicker gingiva to conceal the periodontal probe as compared to female.<sup>[8]</sup> Study by Eghbali et al. documented the presence in 1/3rd of female samples with thin scalloped gingival form while 2/3rd of the male samples with broad band of keratinized tissue and thick flat biotype. It is observed that the thin biotype in females was associated with long slender teeth while males showed quadratic teeth with thicker biotype.<sup>[9]</sup>

On comparing the prevalence of gingival biotypes between different age groups, the thicker biotype has been more prevalent in younger age groups. In 2005, Vandana and Savitha used transgingival probing for demonstrating that the gingiva was thicker in the mandibular arch as compared to the maxillary arch.<sup>[10]</sup> Olsson et al.,<sup>[7]</sup> documented that the central incisors with narrow tooth form had greater amount of recession when compared to incisors with square form.

Chang<sup>[11]</sup> in his study stated that an inverse relationship has found to be existing between PH and age. In the present study, the decreased PH has been observed in relation with thick biotype.

**Conclusion:**

Within the limitations of the present survey, following conclusions were drawn: The thicker gingival biotype is associated with short, wider form of teeth while thinner scalloped biotype with long, narrow tooth form. The thicker biotype is more prevalent in male population while thin, scalloped gingival biotype in females. The thick flat biotype is seen in younger individuals while thin scalloped gingival biotype in older age. Decrease in PH is observed with thin biotype

**Images:**



**Thick Biotype**

**Thin Biotype**

**Tables with Legends:**

**Table 1: Crown width/ height ratio among different gender in mm**

	W	H	Male	Female
Incisors	8.74	10.48	0.80	0.82
Canines	7.87	9.95	0.77	0.79

**Table 2: Thick gingival biotype among Males and Females in %**

	N	%
M	117	71.84
F	103	48.72

**Table 3: Mean papillary height in relation to gingival biotype in mm**

Thick biotype	4.51
Thin biotype	4.04

**Table 4: Thick gingival biotype in different age groups in %**

Age group in years	N	%
20-30	103	62.20
30-40	81	60
40-50	36	44

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